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DATA DISTRIBUTION SYSTEM AND : **Mail Stop AF**  
DEVICES USED THEREIN

**SUBMISSION OF VERIFIED ENGLISH LANGUAGE  
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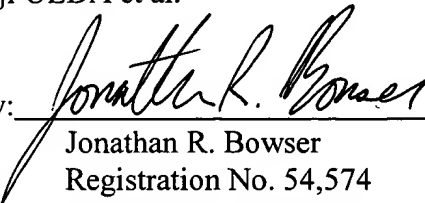
Sir:

Submitted herewith is a verified English language translation of Japanese Patent Application No. 1999-165939, filed on June 11, 1999. The present application claims foreign priority under 35 USC § 119 to Japanese Patent Application No. 1999-165939.

Each of the claims of the present application are supported by the foreign priority document. Accordingly, having perfected the foreign priority date of June 11, 1999, the Applicants respectfully submit that the present application is entitled to an effective filing date of June 11, 1999.

Respectfully submitted,

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### CERTIFICATE OF VERIFICATION

I, Shiro Ogasawara, c/o Ogasawara Patent Office, Daisan-Longev' Bldg., 5th Floor, 3-11, Enoki-cho, Suita-shi, Osaka 564-0053 Japan, state that the attached document is a true and complete translation to the best of my knowledge of Japanese Patent Application No. 1999-165939.

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Signature of translator: \_\_\_\_\_

A handwritten signature in black ink, consisting of stylized cursive letters, positioned above a horizontal line.

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[Title of the Invention] DATA BROADCAST SYSTEM

[Scope of Claims for Patent]

[Claim 1] A data broadcast system comprising a data broadcasting device provided in a broadcasting station which broadcasts multimedia data and a receiving terminal device receiving the multimedia data broadcast from the data broadcasting device,

wherein said data broadcasting device comprises;

data analyzing means for analyzing the contents of said multimedia data and generating output attribute data about said multimedia data, and

data transmitting means for broadcasting said multimedia data together with said output attribute data, and

said receiving terminal device comprises;

receiving means for receiving said multimedia data and said output attribute data which are broadcast,

data managing means for managing and storing said multimedia data and said output attribute data which are received, and

data output means for, by referring to said output attribute data, displaying corresponding said multimedia data.

[Claim 2] The data broadcast system according to claim 1, wherein said data broadcasting device further comprises means for embedding said output attribute data generated by said data analyzing means in said multimedia data, and

said receiving terminal device further comprises data

extracting means for taking out said output attribute data embedded in said multimedia data and outputting the output attribute data to said data managing means.

[Claim 3] The data broadcast system according to claim 2, wherein said data managing means manages said output attribute data extracted by said data extracting means separately from corresponding said multimedia data.

[Claim 4] The data broadcast system according to any of claims 1 to 3, wherein when said multimedia data is data in the form of HTML, said output attribute data comprises information about at least one of the number of links of the data, file names of the linked data, the number of images and the data size.

[Claim 5] The data broadcast system according to any of claims 1 to 3, wherein when said multimedia data is data in the form of JPEG, said output attribute data comprises information about at least one of data type of the data, i.e. a natural painting or a line drawing, and data size.

[Claim 6] A data broadcasting device provided in a broadcasting station which broadcasts multimedia data, said data broadcasting device comprising:

data analyzing means for analyzing the contents of said multimedia data and generating output attribute data about said multimedia data, and

data transmitting means for broadcasting said multimedia data together with said output attribute data.

[Claim 7] The data broadcasting device according to claim 6, further comprising means for embedding said output attribute data generated by said data analyzing means in said multimedia data.

[Claim 8] The data broadcasting device according to claim 6 or 7, wherein when said multimedia data is data in the form of HTML, said output attribute data comprises information about at least one of the number of links of the data, file names of the linked data, the number of images and the data size.

[Claim 9] The data broadcasting device according to claim 6 or 7, wherein when said multimedia data is data in the form of JPEG, said output attribute data comprises information about at least one of data type of the data, i.e. a natural painting or a line drawing, and data size.

[Claim 10] A receiving terminal device which receives multimedia data broadcast together with output attribute data, said receiving terminal device comprising:

receiving means for receiving said multimedia data and said output attribute data,

data managing means for managing and storing said multimedia data and said output attribute data which are received, and

data output means for, by referring to said output attribute data, displaying corresponding said multimedia data.

[Claim 11] The receiving terminal device according to claim 10, further comprising data extracting means for, when said output attribute data is embedded in said multimedia data, extracting from

said multimedia data said output attribute data embedded therein and outputting said output attribute data to said data managing means.

[Claim 12] The receiving terminal device according to claim 11, wherein said data managing means manages said output attribute data extracted by said data extracting means separately from corresponding said multimedia data.

[Claim 13] The receiving terminal device according to any of claims 10 to 12, further comprising data analyzing means for analyzing the contents of said received multimedia data and generating said output attribute data about said multimedia data.

[Claim 14] A data communication system comprising a data communication device for transmitting multimedia data in the form of JPEG and a receiving terminal device receiving the multimedia data transmitted from said data communication device, wherein

said data communication device comprises;

data analyzing means for analyzing the data type of said multimedia data, i.e. whether a natural painting or a line drawing, and

data transmitting means for transmitting said multimedia data together with said data type, and

said receiving terminal device comprises;

receiving means for receiving said multimedia data and said data type which are broadcast, and

data output means which, by referring to said data type, changes the method of displaying corresponding said multimedia data.



[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to a data broadcast system, and more particularly to a system in which multimedia data is broadcast from a data broadcasting device and the broadcast multimedia data is received at and displayed in a data broadcast receiving terminal device.

[0002]

[Prior Art]

Various terminal devices which obtain and display distributed multimedia data have been conventionally developed. Among such devices, terminal devices used on the Internet obtain multimedia data as follows. According to an instruction from a user, the terminal device directly accesses through the Internet a WWW (World Wide Web) server in which multimedia data is previously stored and then retrieves necessary multimedia data.

In this way, the main current of the systems for obtaining multimedia data has been the method of so-called "pull" type, where users freely retrieve target data typically through the Internet as stated above.

[0003]

On the other hand, the demand for multimedia data distribution through broadcasting is currently growing, which belongs to "push" type where data is pushed out toward users. The data distribution

through DAB (Digital Audio Broadcasting) which was developed in the EUREKA-147 project in Europe is an example of the push type. In such data distribution through broadcasting, a user can obtain necessary data by indicating to a receiving terminal a broadcast channel. That is to say, necessary data is automatically received through the specified channel and displayed.

The user of the receiving terminal can thus easily refer to the multimedia data just like through conventional broadcast on TV or radio. In this way, the multimedia data distribution through broadcasting has the advantage of saving the need for executing the process of searching for and taking out necessary data.

[0004]

[Problems to be Solved by the Invention]

However, the above-explained multimedia data distribution through broadcasting differs from the real time data distribution from WWW servers on the Internet (through a set of a data reference request from a user and a distribution response) and a broadcasting station cannot process reference requests from users in real time. It is hence difficult for the users to control the contents of the broadcast multimedia data.

[0005]

That is to say, when users demand to refer to arbitrary multimedia data, it is difficult for the broadcasting station in the data broadcasting system to satisfy every reference request in real time. Accordingly the users must wait until multimedia data they want

to refer to are broadcast according to a predetermined broadcast program.

Now, if data can be stored in the receiving terminal to a certain extent, the user can locally refer to the multimedia data broadcast in the past. However, the multimedia data which can be referred to is limited to only part of data stored in the data broadcast equipment in the broadcasting station. Thus, anyway, the user is actually allowed just to fragmentarily and time-sequentially receive and refer to only part of the multimedia data existing in the data broadcasting equipment.

[0006]

For example, when the multimedia data to be referred to is in the form of HTML (Hyper Text Markup Language) having a link structure, the user cannot conveniently refer to the data until they receive data linked to the multimedia data.

Moreover, when the linked data is absent in the data broadcasting equipment, e.g. when the linked multimedia data resides in an external WWW server, the user cannot even know the outlines of the data, not to mention referring to the multimedia data.

[0007]

As stated above, in the multimedia data distribution through data broadcasting, users cannot know what multimedia data will be broadcast and have to wait passively; the multimedia data distribution through broadcasting thus has the problem that the users cannot grasp the entire structure of the broadcast data and therefore have

difficulty in judging which data are necessary. Thus, the users cannot instantaneously decide whether multimedia data linked to the multimedia data currently referred to is necessary, and therefore they cannot decide whether to store the multimedia data currently referred to. This fact not only makes it difficult for the users to grasp the information about the entire data but also requires the terminal devices receiving the data broadcast to be equipped with storage devices with increased capacity.

[0008]

The problem above that the contents of broadcast data cannot be known until it is received leads to other problems related to the attributes of the multimedia data to be displayed. Such problems include one related to dithering used when displaying JPEG (Joint Photographic Experts Group) images, for example.

[0009]

Most mobile receiving terminals are not provided with sufficient display capabilities because of the cost restriction etc. For example, receiving terminals capable of displaying only up to 256 colors at one time cannot clearly display some JPEG data images such as photographs with gentle gradation; the gradation may be displayed like stripes and then the picture will look very clumsy. On the other hand, such receiving terminals can well display line drawings like graphs with enhanced contrast. Techniques for displaying JPEG data as smooth images include dithering; the dithering processing enables JPEG data like photographs with gradations to be displayed as an image

close in appearance to the original picture, but, when displaying line drawing data like graphs, the whole becomes unclear, where edges become especially unclear, and may be displayed as a deteriorated image with illegible details.

[0010]

However, as stated above, the user cannot know the type of the broadcast data until they receive the data and display the image, so that the user must once display the data in one mode (with dithering or without dithering) and then change the image display processing mode when the display has some trouble.

[0011]

Therefore an object of the present invention is to provide a data broadcast system wherein link information, image display information, etc. corresponding to multimedia data are previously generated and broadcast together with the multimedia data so that the outlines of the entire multimedia data can be grasped and the visibility is improved in the receiving terminal.

[0012]

[Solution to the Problems and Effect of the Invention]

A first invention is directed to a data broadcast system comprising a data broadcasting device provided in a broadcasting station which broadcasts multimedia data and a receiving terminal device receiving the multimedia data broadcast from the data broadcasting device,

wherein the data broadcasting device comprises;

data analyzing means for analyzing the contents of the multimedia data and generating output attribute data corresponding to the multimedia data, and

data transmitting means for broadcasting the multimedia data together with the output attribute data, and

the receiving terminal device comprises;

receiving means for receiving the multimedia data and the output attribute data which are broadcast,

data managing means for managing and storing the multimedia data and the output attribute data which are received, and

data output means for, by referring to the output attribute data, displaying the corresponding multimedia data.

[0013]

As stated above, in accordance with the first invention, the data broadcasting device broadcasts multimedia data together with its output attribute data, so that a user can know additional information attached to the broadcast data without receiving or analyzing those data.

[0014]

A second invention depends on the first invention,

wherein the data broadcasting device further comprises means for embedding the output attribute data generated by the data analyzing means in the multimedia data, and

the receiving terminal device further comprises data extracting means for taking out the output attribute data embedded in the

multimedia data and outputting the output attribute data to the data managing means.

[0015]

As stated above, in accordance with the second invention, in the first invention, the data broadcasting device embeds generated output attribute data in the multimedia data and broadcasts the same, and the data receiving device obtains the output attribute data embedded in the multimedia data and displays the multimedia data referring to the information. Accordingly the receiving terminal device does not have to separately manage the multimedia data and the output attribute data; it can collectively manage the multimedia data. This allows a reduction in capacity of the storage device of the receiving terminal device, and the receiving terminal device can obtain display attributes by referring only to the display target multimedia data to be displayed. Moreover, after that, the receiving terminal device can send/receive the display attributes by sending/receiving the multimedia data.

[0016]

A third invention depends on the second invention,

where the data managing means manages the output attribute data extracted by the data extracting means separately from the corresponding multimedia data.

[0017]

As stated above, in accordance with the third invention, the receiving terminal device of the second invention separates the output

attribute data from the received multimedia data and manages the output attribute data independently. Accordingly the data broadcast together with the output attribute data embedded therein is stored in the original format of the multimedia data in the receiving terminal device. Therefore it is possible to secure for the user that the data stored in the receiving terminal device is not altered. Further, after that, the receiving terminal device can send/receive the multimedia data in its original format intended by the provider of the multimedia data.

[0018]

A fourth invention depends on the first to third inventions, wherein when the multimedia data is data in an HTML format, the output attribute data comprises information about at least one of the number of links of the data, file names of the linked data, the number of images and the data size.

[0019]

A fifth invention depends on the first to third inventions, where when the multimedia data is data in a JPEG format, the output attribute data comprises information about at least one of data type of the data, i.e. a natural painting or a line drawing, and data size.

[0020]

As stated above, the fourth and fifth inventions show, in the first to third inventions, typical output attribute data information in particular multimedia data forms.

When information about data linked to HTML format data is set



as the output attribute data as shown in the fourth invention, the user can judge the importance of data information not received. When setting about dithering to JPEG format data is set as the output attribute data as in the fifth invention, the user can automatically display an appropriate JPEG image without manually setting dithering.

[0021]

A sixth invention is directed to a data broadcasting device provided in a broadcasting station which broadcasts multimedia data, the data broadcasting device comprising:

data analyzing means for analyzing the contents of the multimedia data and generating output attribute data about the multimedia data, and

data transmitting means for broadcasting the multimedia data together with the output attribute data.

[0022]

As stated above, in accordance with the sixth invention, the data broadcasting device broadcasts multimedia data together with its output attribute data, so that a user can know additional information attached to the broadcast data without receiving or analyzing those data.

[0023]

A seventh invention depends on the sixth invention,

where the data broadcasting device further comprises means for embedding the output attribute data generated by the data analyzing means in the multimedia data.

[0024]

As stated above, in accordance with the seventh invention, in the sixth invention, the data broadcasting device embeds generated output attribute data in the multimedia data and broadcasts the same. Accordingly the receiving terminal device does not have to separately manage the multimedia data and the output attribute data; it can collectively manage the multimedia data. This allows the receiving terminal device to be equipped with a storage device having a reduced capacity, and the receiving terminal device can obtain display attributes by referring only to the multimedia data to be displayed.

[0025]

An eighth invention depends on the sixth and seventh inventions, wherein when the multimedia data is data in an HTML format, the output attribute data comprises information about at least one of the number of links of the data, file names of the linked data, the number of images and the data size.

[0026]

A ninth invention depends on the sixth and seventh inventions, where when the multimedia data is data in a JPEG format, the output attribute data comprises information about at least one of data type of the data, i.e. a natural painting or a line drawing, and data size.

[0027]

As stated above, the eighth and ninth inventions show, in the sixth and seventh inventions, typical output attribute data

information in particular multimedia data forms.

When information about data linked to HTML form data is set as the output attribute data as shown in the eighth invention, the user can judge the importance of data information not received. When setting about dithering to JPEG form data is set as the output attribute data as in the ninth invention, the user can automatically display an appropriate JPEG image without manually setting dithering.

[0028]

A tenth invention is directed to a receiving terminal device which receives multimedia data broadcast together with output attribute data, the receiving terminal device comprising:

receiving means for receiving the multimedia data and the output attribute data,

data managing means for managing and storing the multimedia data and the output attribute data which are received, and

data output means for, by referring to the output attribute data, displaying the corresponding multimedia data.

[0029]

As stated above, according to the tenth invention, the multimedia data and output attribute data are both received, so that the user can know information attached to the broadcast data without receiving and analyzing those data.

[0030]

An eleventh invention depends on the tenth invention, where the receiving terminal device further comprises data

extracting means for, when the output attribute data is embedded in the multimedia data, extracting from the multimedia data the output attribute data embedded therein and outputting the output attribute data to the data managing means.

[0031]

As stated above, in accordance with the eleventh invention, in the tenth invention, the data receiving device obtains the output attribute data embedded in the multimedia data and displays the multimedia data referring to the information. Accordingly the receiving terminal device does not have to separately manage the multimedia data and the output attribute data; it can collectively manage the multimedia data. This allows the receiving terminal device to be equipped with a storage device having a reduced capacity, and the receiving terminal device can obtain display attributes by referring only to the display target multimedia data. Moreover, after that, the receiving terminal device can send/receive the display attributes by sending/receiving the multimedia data.

[0032]

A twelfth invention depends on the eleventh invention, wherein the data managing means manages the output attribute data extracted by the data extracting means separately from the corresponding multimedia data.

[0033]

As stated above, in accordance with the twelfth invention, in the eleventh invention, the receiving terminal device separates the

output attribute data from the received multimedia data and manages the output attribute data independently. Accordingly the data broadcast together with the output attribute data embedded therein is stored in the original format of the multimedia data in the receiving terminal device. Therefore it is possible to secure that the stored data is not altered. Further, after that, the multimedia data can be sent/received in its original format intended by the provider of the multimedia data.

[0034]

A thirteenth invention depends on the tenth to twelfth inventions,

wherein the receiving terminal device further comprises data analyzing means for analyzing the contents of the received multimedia data and generating output attribute data about the multimedia data.

[0035]

As stated above, according to the thirteenth invention, in the tenth to twelfth inventions, the receiving terminal device analyzes received multimedia data by itself and generates output attribute data. Accordingly it is possible to make display based on the output attribute data on the basis of internally stored data even when the output attribute data is not broadcast. Hence the output attribute data of the multimedia data can be transmitted to another terminal device via this receiving terminal device. Further, it is possible to set new output attribute data adapted to the device.

[0036]

A fourteenth invention is directed to a data communication system comprising a data communication device for transmitting multimedia data in a JPEG format and a receiving terminal device receiving the multimedia data transmitted from the data communication device,

wherein the data communication device comprises;

data analyzing means for analyzing the data type of said multimedia data, i.e., whether a natural painting or a line drawing, and

data transmitting means for transmitting the multimedia data together with the data type,

and the receiving terminal device comprises;

receiving means for receiving the multimedia data and the data type which are broadcast, and

data output means which, by referring to the data type, changes the method of displaying the corresponding multimedia data.

[0037]

As stated above, in accordance with the fourteenth invention, the data communication device transmits multimedia data of JPEG form and its data type together, which allows the user to automatically display an appropriate JPEG image as soon as they receive the data, without manually setting dithering.

[0038]

[Embodiments of the Invention]

An embodiment of the present invention will now be described

referring to the drawings.

Fig.1 is a block diagram showing the structure of a data broadcast system according to an embodiment of the invention. In Fig.1, the data broadcast system of this embodiment includes a data broadcasting device 1 and a receiving terminal device 2.

The data broadcasting device 1 broadcasts multimedia data and the receiving terminal device 2 receives the multimedia data broadcast from the data broadcasting device 1 and displays the multimedia data according to instructions from a user.

[0039]

First, the structure of the data broadcasting device 1 in the data broadcast system of this embodiment will be described in detail.

Referring to Fig.1, the data broadcasting device 1 includes a data storage portion 11, a file manager 12, a data analyzing 13, a protocol encoder 14, and a transmitter 15.

The file manager 12 manages data input/output to and from the data storage portion 11. The data analyzing 13 analyzes multimedia data obtained by the file manager 12 and generates their output attribute data. The multimedia data and output attribute data are stored in the data storage portion 11. The output attribute data is data which is referred to when the receiving terminal device 2 displays the multimedia data.

For the form in which the output attribute data is stored in the data storage portion 11, the output attribute data may be stored in a separate file associated with the corresponding multimedia data,

or the output attribute data may be embedded in the corresponding multimedia data and stored, for example.

[0040]

The multimedia data and output attribute data outputted from the file manager 12 undergo a predetermined encoding process (e.g. multiple encoding in DAB) in the protocol encoder 14 and broadcast toward the receiving terminal device 2 through the transmitter 15.

For the method of multiple-encoding the output attribute data, the output attribute data may be encoded alone or may be embedded in the multimedia data and encoded.

[0041]

Next the structure of the receiving terminal device 2 in the data broadcast system of this embodiment will be described in detail.

Referring to Fig.1, the receiving terminal device 2 includes a tuner 21, a protocol decoder 22, a file manager 23, a data analyzing portion 24, a data storage portion 25, and a browser 26.

The tuner 21 receives the encoded multimedia data and output attribute data broadcast from the data broadcasting device 1. The protocol decoder 22 decodes the encoded data received at the tuner 21 to restore the original multimedia data and output attribute data. The restored data are outputted to the file manager 23. The file manager 23 manages data input/output to and from the data storage portion 25. When the output attribute data is embedded in the multimedia data, the data analyzing portion 24 separates the output attribute data from the multimedia data. Received multimedia data and the output attribute



data are stored in the data storage portion 25. The file manager 23 reads the stored data at any time according to an instruction from a user, and the contents of the data are displayed in the browser 26. When multimedia data is displayed in the browser 26, the output attribute data corresponding to that multimedia data is referred to and the additional information is displayed together.

[0042]

Now more specifically discussed referring to Figs.2 to 7, the processes in which the data broadcast system of the embodiment of the invention generates, distributes and receives the output attribute data and displays the multimedia data using the output attribute data.

In this embodiment of the invention, HTML data is explained as an example of data having a link structure and JPEG data is explained as an example of image data, and methods for generating their output attribute data will be described.

[0043]

First, a relation among data is described referring to Fig.2. Fig.2 shows the relation among multimedia data used in the description below.

Data 121 to data 123 are HTML data (with extensions [.html]). Data 124 and data 125 are JPEG data (with extensions [.jpg]). Data 126 to data 128 are output attribute data generated from the data 121, data 122 and data 125, respectively (with extensions [.atr] in this example). The data 123 and data 124 exist on the outside. Seen from the data broadcasting device 1, the data existing outside are data

existing on the Internet, for example, which are, seen from the receiving terminal device 2, data not received, or not stored in the data storage portion 25.

It is assumed that the data 121 and data 122 are linked bidirectionally and the data 122 is linked to the data 123 to data 125.

[0044]

Fig.3 is a diagram showing an example of a table 130 defining data types. In the table 130 of Fig.3, multimedia data are provided with data IDs and signs in correspondence with their type.

HTML data has a data type ID "0" and a sign "L". The sign "L" is the initial letter of "LINK". JPEG natural painting data has a data type ID "1" and a sign "P". The sign "P" is the initial letter of "PAINT". JPEG line drawing data has a data type ID "2" and a sign "D". The sign "D" is the initial letter of "DRAW". The data type IDs and signs are just examples, which can be freely customized as long as they match between the data broadcasting device 1 and the receiving terminal device 2.

[0045]

Now discussed referring to Figs.4 and 5, how the data broadcasting device 1 generates and manages the output attribute data considering the HTML link information and JPEG data information.

First, referring to Fig.4, the data broadcasting device 1 searches the multimedia data in the data storage portion 11 (step S401) and decides whether there is any multimedia data the output attribute

data is to be generated(hereinafter referred to as target multimedia data; step S402). The target searched for in step S402 is basically multimedia data with which the output attribute data has not generated yet, but any multimedia data may be the target. When the decision made in step S402 shows that there is target multimedia data, the data broadcasting device 1 generates an output attribute data table (step S403). On the other hand, when the decision in step S402 shows absence of target multimedia data, the data broadcasting device 1 ends this process.

The output attribute data will be described in detail later.

[0046]

Next the data broadcasting device 1 decides the type of the target multimedia data (step S404). In this example, the step S404 decides whether the multimedia data is in the HTML form, JPEG form, or other form. When the decision of step S404 shows that the target multimedia data is HTML data, the data broadcasting device 1 generates HTML form output attribute data and sets the data in the output attribute data table (step S405). When the decision made in step S404 shows that the target multimedia data is JPEG data, the data broadcasting device 1 further decides which image type the JPEG data is of (whether it is a natural painting or line drawing; see Fig.3) (step S406), and then generates output attribute data of the JPEG form on the basis of the image type and sets the data in the output attribute data table (step S407). On the other hand, if the decision made in step S404 shows that the target multimedia data is data other than

HTML and JPEG, the data broadcasting device 1 discards the output attribute data table generated in step S403 (step S411) and returns to step S401 to search for next multimedia data.

The type of the multimedia data can be usually found with ease through the extension added to the file name.

[0047]

Next, when the target multimedia data is HTML data, the data broadcasting device 1 operates to generate the output attribute data about data linked to the HTML data (hereinafter linked data).

Referring to Fig.5, after setting the output attribute data of the target multimedia data (step S405), the data broadcasting device 1 takes out link information contained in the target multimedia data (step S501), and then decides whether any linked data is present (step S502) and whether the linked data is obtainable (step S503). When the decision of step S502 shows absence of linked data, the data broadcasting device 1 moves to step S408 without generating output attribute data about linked data. When the decision of step S503 shows that the linked data is not obtainable, the flow returns to step S501 to take out the next linked data.

[0048]

When the decision made in step S503 shows that the linked data can be obtained, the data broadcasting device 1 obtains the linked data and decides its type (step S504). In this example, the step S504 decides whether the multimedia data is in the HTML form, JPEG form or other form. If the decision made in step S504 shows that the linked

data is HTML data, the data broadcasting device 1 analyzes the HTML data (step S505), generates the output attribute data of the HTML form and sets the data in the output attribute data table (step S507). When the decision made in step S504 shows that the linked data is JPEG data, the data broadcasting device 1 further decides the JPEG image type (a natural painting or line drawing, see Fig.3: step S506) and then generates the output attribute data of JPEG form on the basis of the image type and sets the data in the output attribute data table (step S507). When the decision of step S504 shows that the linked data is data other than HTML and JPEG, the data broadcasting device 1 returns to step S501 to take out the next linked data.

The processing in steps S501 to S507 are applied to all linked data in the target multimedia data.

[0049]

Referring to Fig.4 again, the data broadcasting device 1 next decides whether or not to embed the set output attribute data in the target multimedia data (step S408). The decision made in step S408 may be given on the basis of a flag specified by a user, or may be defined on the basis of system constant, or may be decided for each piece of multimedia data; the method of making decision can be arbitrarily decided in the system. When the step S408 decides to embed, the data broadcasting device 1 then embeds the output attribute data in the target multimedia data (step S409); when it decides not to embed, the data broadcasting device 1 stores the output attribute data as another file in the data storage portion 11 (step S410). When the output

attribute data is stored as a separate file, the output attribute data can be associated with the target multimedia data by giving the file the same name as the target multimedia data and an extension [atr].

[0050]

Next the structure of the output attribute data is specifically explained.

Fig.6 is a diagram showing specific examples of the output attribute data table for storing the output attribute data.

The table 161 shown in Fig.6(a) shows the contents of the output attribute data 127 [Base.atr] about the HTML data 122 [Base.html] of Fig.2, and the HTML data 122 is HTML data as shown in Fig.7. The table 162 shown in Fig.6(b) shows the contents of the output attribute data 128 [P2.atr] about the JPEG data 125 [P2.jpg] of Fig.2. The table 163 shown in Fig.6(c) shows the contents of the output attribute data 126 [Top.atr] about the HTML data 121 [Top.html] of Fig.2.

[0051]

The table 161 shows items which are set as the output attribute data of the target multimedia data in the column direction, and the output attribute data of data linked to the target multimedia data are recorded in the row direction.

The link ID is assigned to records of the output attribute data about the linked data in the HTML data 122. The link IDs are managed with serial numbers starting from "0"; "0" specifically shows the record of the output attribute data of itself. That is to say, the output attribute data [Base.html] of the HTML data 122 is recorded

there. As can be seen from the maximum value of the link ID in the table 161, the HTML data 122 has 42 links to data. URL (Uniform Resource Locator) is a character string showing the storage location of linked data. These character strings are each set within a link tag represented by "<A" and "</A>" in the HTML format data. The values of the data type ID defined in the aforementioned data type table 130 of Fig.3 are recorded as the data type in accordance with the type of the linked data. The number of links of the linked data is as the link number. When the linked data is not in the HTML format, e.g. when it is JPEG data, then the value is fixed at "0." Recorded in the image number is the number of images included in the linked data. When the linked data is not in the HTML format, e.g. when it is JPEG data, the value is fixed at "1." The amount of data of the linked data represented in Kbytes is recorded as the data size.

It is known from the table 161 containing the linked data information that 42 pieces of linked data are in the HTML data 122; the following items can be known about the linked data by referring to the records: the URL, data type, number of links, number of images and data size.

[0052]

A specific example of analysis of the HTML data 122 of Fig.7 is now shown.

First, the output attribute data of the HTML data 122 itself is stored in the record of link ID = 0. That is to say, the data shows the following information: the URL is file name [Base.html], the data

type is HTML data, the number of links is 42, the number of images is 23, and the data size is about 11 Kbytes. The link number = 42 in the record of link ID = 0 coincides with the maximum value 42 of the link ID in the table 161, and the image number = 30 coincides with the number of records of the data type 1 or 2 in the table 161.

Next, the record of link ID = 1 corresponds to the link tag R1 in the HTML data 122. The linked URL of the link tag R1, [http://www.a.co.jp/Basel.html], shows that the linked data resides in an external WWW server and its data type is HTML. Further, the following information can be obtained about the linked data [Basel.html] by analyzing the data: the link number is 12, the image number is 5 and the data size is about 2 Kbytes.

Next, the record of the link ID = 2 corresponds to the link tag R2 in the HTML data 122. The linked URL of the link tag R2, [http://www.b.co.jp/pict/P1.jpg], shows that the linked data resides in an external WWW server and its data type is JPEG data. Further, it is known by analyzing the linked data [P1.jpg] that the data [P1.jpg] is a natural painting and the data size is about 5 Kbytes. Since the data [P1.jpg] is JPEG data, the link number is fixed at 0 and the image number at 1.

Next, the record of the link ID = 3 corresponds to the link tag R3 in the HTML data 122. The linked URL of the link tag R3, [../pict/grp/P2.jpg], shows that the linked data resides in the data storage portion 11 and its data type is JPEG data. Further, it is known by analyzing the linked data [P2.jpg] that the data [P2.jpg] is a line



drawing and the data size is about 3 Kbytes. Since the data [P2.jpg] is JPEG data, the link number is fixed at 0 and the image number at 1.

Similarly, the record of the link ID = 42 corresponds to the link tag R42 in the HTML data 122. The linked URL of the link tag R42 [../Top.html] shows that the linked data resides in the data storage portion 11 and its data type is HTML. Further, it is known by analyzing the linked data [/Top.html] that the link number of the data [/Top.html] is 74, the image number is 15, and the data size is about 2 Kbytes.

[0053]

The table 163 shown in Fig.6(c) shows the output attribute data 126 [Top.attr] about the HTML data 121 [Top.html] of Fig.2. While the contents of the table 163 are not described here since they are clear from the description about the table 161, the contents of the record of the link ID = 0 in the table 163 are the same as the record in the link ID = 42 in the table 161 except the URL. Though describing the same data, the URL is represented in different ways in the table 161 and the table 163 where different data are focused on, since the URLs are those of data linked to the focused data.

The contents of the record of the link ID = 74 in the table 163 are the same as the record of the link ID = 0 in the table 161 except the URL.

[0054]

The table 162 shown in Fig.6(b) shows the output attribute data [P2.attr] about the JPEG data 125 [P2.jpg] of Fig.2. Since the data

[P2.jpg] is JPEG data, it has no link to other data. Accordingly it only has the link ID "0" showing the data itself. The contents set in the link ID = 0 are the same as the record of the link ID = 3 in the table 161 shown in Fig.6(a) except the URL.

[0055]

The display attributes of the linked data can be set by extracting image tags and link tags of the target HTML data and obtaining the number of images and the number of links of the data specified there. These processes are usually performed when displaying HTML data in the browser 26 etc. In this invention, these processes are performed before displaying the data. The technique of finding the image type of JPEG data belongs to the category of image recognition.

For example, whether JPEG data is a line drawing or natural painting can be generally determined according to the concentration distribution of the image colors. In the case of a line drawing, the gradation rapidly changes, and it gradually changes in the case of a photograph image. Accordingly the two can be distinguished by setting a certain threshold and calculating concentration differences of adjacent pixels.

[0056]

As has been explained about the steps S409 and S410 in the flowchart of Fig.4, the generated output attribute data is embedded in the target multimedia data or is stored in a separate file. When the output attribute data is stored in a separate file, it is easily

known by changing the extension of the file name as described above that the file is a storage of output attribute data and to which multimedia data file the file is related.

Hence, next, a method of storing the output attribute data while embedding it in the multimedia data will be described below in examples of data of the HTML format and the JPEG format.

[0057]

First, a method of embedding the output attribute data in HTML data is described.

Referring to Fig.7, the link tags R1, R2 ... R42 in the HTML data 122 correspond to the records of the link IDs = 1, 2 ... 42 in the table 161 shown in Fig.6(a). The output attribute data 127 in Fig.7 corresponds to the table 161 shown in Fig.6(a)

The data 701 shown in Fig.7 is a diagram showing the output attribute data 127 embedded in the HTML data 122. In the data 701, the underlined text parts correspond to the embedded output attribute data. Note that the underlines are provided only for description, which are absent in practice.

The underlined parts (from "<!--" to "-->") are handled as comments in the HTML format, which are not displayed in the browser 26. In the example of this embodiment, a new ATR tag is defined in the comment part; the output attribute data is embedded in the part surrounded by "<ATR>" to "</ATR>." The output attribute data is composed of the four numbers surrounded by "[" and "]" and sectioned by ","; these four numbers respectively correspond to the items set

in the display attribute table 161 shown in Fig.6(a). The first item T1 shows the data type, the second item shows the link number, the third item shows the image number and the fourth item shows the data size.

[0058]

Next, a method for embedding the output attribute data in JPEG data will be described.

The format of JPEG data contains a region called application data segment, where arbitrary values other than the image data are set and used. In the example of this embodiment, the image type of JPEG data described above is embedded in this region.

The structure of the JPEG data is described in detail in "ITU-T White Book, Recommendations on Digital Still Image Compression Encoding, New Japan ITU," for example.

[0059]

Fig.8 is a diagram showing an example of the application data segment region, in which the image type of JPEG data is embedded.

A marker code indicating one application segment in the JPEG data is set in two bytes in the region 810. In the application data segment, 16 codes from "0xFFE0" to "0xFFEF" are available as the marker code; the example of the embodiment uses "0xFFEF" among them. The data length of the application segment is set in the region 811; the total number of bytes of the region 812 and the region 813 is set in two bytes. In the example of this embodiment, it is six bytes. A character code is set in the region 812, which indicates that a flag showing

the image type of the JPEG data is set in the following data (data in the region 813). In the example of this embodiment, four letters "K," "I," "N," "D" are set in four bytes. In the region 813, a numerical value showing the image type of the JPEG data is set in two bytes. The value set in the region 813 is the data type shown in the table 130 of Fig.3 about the JPEG data. Since this value is "1" in the example shown in Fig.8, it is known that the JPEG data is a natural painting.

[0060]

The output attribute data and multimedia data described above are broadcast from the data broadcasting device 1 in a given system (e.g. DAB) and received at the receiving terminal device 2. DAB defines a transfer protocol called MOT (Multimedia Object Transfer Protocol) as the highest-order protocol for data transfer. The MOT protocol is now described.

[0061]

Fig.9 is diagram showing the structure of MOT protocol 911. As shown in Fig.9, the MOT protocol 911 is composed of a MOT header 912 and a MOT body 913. The MOT body 913 is the multimedia data. The MOT header 912 describes the attributes of the data transferred in the MOT body 913, such as the type of data, name of the data file, etc. The receiving terminal device 2 receives the multimedia data 914 in the MOT protocol 911 and takes out the data to perform appropriate processing.

[0062]

In the example of this embodiment, the multimedia data 914 and

the output attribute data 915 described so far are set in the MOT body 913 and broadcast. The multimedia data and its output attribute data present in the data broadcasting device 1 can thus be transferred to the receiving terminal device 2.

In the data broadcasting device 1, the multimedia data 914 and the output attribute data 915 are stored in the MOT protocol 911 and then stored in a lower-order protocol of DAB and broadcast. In the receiving terminal device 2, the tuner 21 receives the broadcast data and the protocol decoder 22 decodes the data to the MOT protocol 911 and takes out the MOT header 912 and the MOT body 913; the multimedia data 914 and the output attribute data 915 received through the MOT body 913 is then sent to the file manager 23.

[0063]

The contents of the MOT body 913 include the three kinds: multimedia data, output attribute data, and multimedia data in which the output attribute data is embedded. However, the receiving terminal device 2 does not only store the data in the data storage portion 25 and utilize the data when presenting display with the browser 26; it may generate new output attribute data using the data analyzing portion 24 as needed, or may embed the data in the multimedia data, or may separate the output attribute data embedded in the multimedia data and store the data in a separate file.

As already stated, this system broadcasts the output attribute data alone, or in a form embedded in the multimedia data.

[0064]

Next, a method of displaying the multimedia data using the received output attribute data in the receiving terminal device 2 will be described.

Now, referring to Figs.7, 10 to 12, examples of displaying HTML data and JPEG data will be described.

[0065]

First, a method for displaying multimedia data using the output attribute data about the HTML data will be described.

Referring to Fig.10, the receiving terminal device 2 first analyzes the structure of the display target HTML data and obtains various tag information (step S1001). At the same time, if display attributes are set in the comment line of the anchor tags, the receiving terminal device 2 obtains them. Next, the receiving terminal device 2 examines whether display attributes are set in the HTML data (and whether display attributes are set in the comment line of the anchor tags; step S1002). When the examination in step S1002 shows that display attributes are set, the receiving terminal device 2 then displays the display attributes in a given form when displaying the anchor tags, if present (step S1005). When the examination in step S1002 shows that no display attributes are set, the receiving terminal device 2 decides that the display attributes of the HTML data are not set in the HTML data and further examines whether another file having the extension [atr] and a file name with the same body is present (step S1003). When the examination of step S1003 shows that another file is present, the receiving terminal device 2 analyzes the display attribute file and

obtains the display attributes (step S1004) and then displays the display attributes in a given form (step S1005). However, when the examination of step S1003 shows absence of another file, the receiving terminal device 2 does not display the display attributes even if anchor tags are present (step S1006).

[0066]

More specifically, the display screen 702 is an example which displays the HTML data 122 without referring to the output attribute data 127. Display like this is presented when the display browser 26 cannot examine the above-described link tags of the display attributes, when it intentionally does not refer to the output attribute data 127, and when the output attribute data 127 is absent, for example. In such cases, as shown in the display screen 702, the display screen of the browser 26 does not display information about linked data of the HTML data 122.

[0067]

The display screen 703 shows an example in which the HTML data 122 is displayed referring to the output attribute data 127. The HTML data 122 can be displayed referring to the output attribute data 127 by the following two methods.

In a first method, when output attribute data using the HTML data 122 and the output attribute data 127 are set outside of the HTML data 122, the external output attribute data is referred to. A second method is a method wherein the output attribute data 127 is referred to when the output attribute data 127 is embedded in the HTML data



122.

[0068]

The first method is described first. The output attribute data 127 of the HTML data 122 is data as shown in the table 161 of Fig.6(a). When displaying the link tags R1, R2 ... R42 of the HTML data 122, the browser 26 refers to the output attribute data 127 recorded as shown in the table 161; the attributes of the linked data are thus displayed as shown as P1, P2 ... P42 in the display screen 703. For example, the display attributes of the link tag R1 in the HTML data 122 are the values recorded in the link ID = 1 in the table 161.

The items shown as P1, P2 ... P42 in the display screen 703 show the following information: the first alphabet indicates the data type in the table 161; "L" shows the data type "0" or HTML data, "P" shows the data type "1" or JPEG natural painting data, and "D" shows the data type "2" or JPEG line drawing data. The second number shows the number of links. The third number shows the number of images. The fourth number shows the data size.

As described above, when output attribute data which utilizes the HTML data 122 and the output attribute data 127 are present outside, the user can refer to the current HTML data 122 and also the information about the linked data.

[0069]

Next, the second method is described. When displaying T1, T2 ... T42 in the data 701, the browser 26 refers to the output attribute data 127 set inside, and the attributes of the linked data are displayed

as shown as P1, P2 ... P42 in the display screen 703. For example, since [0, 12, 5, 2] are set in T1 in the data 701, the display screen 703 displays [L, 12, 5, 2] as shown in P1.

As stated above, when the output attribute data 127 is embedded in the HTML data 122, the user can refer to the current HTML data 122 and also the information about the linked data.

[0070]

As a result, by referring to the output attribute data generated before data is displayed, a user can know the outlines of the attributes of related data without actually displaying the linked data of the data currently referred to; the user can thus efficiently refer to the data. For example, with the receiving terminal device 2, it is possible to know the type, link number, size, etc. of the data if the output attribute data can be obtained, even if the linked data is not received or is absent in the data broadcasting device 1.

While the display attributes of related data are displayed in text form in this embodiment, the numerical values may be represented by icons, voice, etc. if the receiving terminal has a sufficient image display capability.

[0071]

Next a method of displaying multimedia data using output attribute data about JPEG data will be described.

Referring to Fig.11, the receiving terminal device 2 first examines whether the image type of the JPEG data is embedded in the JPEG data (step S1101). As shown in Fig.8, the information about the

image type is set in the region 811 application data segment "0xFFEF" in the JPEG data, so the receiving terminal device 2 examines the region 811. When the examination of step S1101 finds the "KIND" item in the region 812 in the region 811, then the receiving terminal device 2 takes out the value in the region 813 as the image type of the JPEG data (step S1102). When the "KIND" item is not set in the region 812 of the region 811, the receiving terminal device 2 decides that the image type of the JPEG data is not set in the JPEG data and further examines whether another file having the extension [atr] and the same body portion of the file name is present (step S1103). When the examination of step S1103 finds another file, the receiving terminal device 2 then obtains the JPEG data image type from the file (step S1104); when there is no separate file, it sets the JPEG image type as line drawing as default (step S1105).

After obtaining the image type of the JPEG data from the output attribute data, the receiving terminal device 2 decodes the JPEG data (step S1106). Subsequently, the receiving terminal device 2 refers to the set image type (step S1107); when the image type is "1" or a natural painting image, the receiving terminal device 2 applies dithering to the original image when displaying it in the browser 26 (step S1108); otherwise it displays it as it is (step S1109).

[0072]

In this way, when the output attribute data about JPEG data is broadcast independently or being embedded in the JPEG data, the receiving terminal device 2 can receive the data and present an image

display in accordance with the data type. Further, since the output attribute data described herein is set in a region to be arbitrarily referred to in the JPEG data, structures displaying JPEG other than that of this data broadcast system can display the images without problems.

[0073]

While the description has shown examples using the output attribute data which have been set in the data broadcasting device 1, this data broadcast system has the data analyzing portion 24 in the receiving terminal device 2, so that it can newly generate the output attribute data, or separate the output attribute data from the target multimedia data, or change the output attribute data.

[0074]

HTML data embedding the output attribute data inside as shown in the data 701 of Fig.7 can be converted into the HTML data 122 and the output attribute data 127 by extracting the aforementioned portions from "<!--<ATR>" to "</ATR>-->" and URLs in the link tag portions and converting them into a table.

The output attribute data set inside JPEG data can be converted into the table 162 of Fig.6(b) by setting its data file name as the URL with the link ID fixed at "0". The image type set in the marker code "0xFFEF" in the JPEG data is set as the data type. The number of images is fixed at "1" and the size of the data file can be set as the data size in Kbytes.

While the receiving terminal device 2 can change the way of

holding the output attribute data as described above, it can also change the display data attributes.

Now, examples where setting about dithering of JPEG data is changed are explained.

[0075]

The methods for setting the output attribute data of JPEG data in the receiving terminal include a first method of changing the output attribute data embedded in JPEG data, a second method of changing the output attribute data set in a file separate from the JPEG data, and a third method of deleting the output attribute data embedded in the JPEG data.

[0076]

The first method to change the output attribute data embedded in JPEG data is now described referring to Fig.12.

When displaying an image of JPEG data, the receiving terminal device 2 decides whether or not to apply dithering (step S1201). The step S1201 decides not to apply dithering when the receiving terminal device 2 has sufficient resolution for image display or when the processing load of dithering should be removed in the process of displaying image. When the step S1201 decides not to apply dithering, the receiving terminal device 2 presumes the JPEG data to be a line drawing and sets "2" in the image type region in the application data segment "0xFFEF" in the JPEG data (step S1202). The step S1201 decides to apply dithering when the receiving terminal device 2 does not have sufficient image display resolution or when the processing load of

dithering is acceptable in image display. When the step S1201 decides to apply dithering, the receiving terminal device 2 presumes the JPEG data to be a natural painting and sets "1" in the image type region in the application data segment "0xFFEF" in the JPEG data (step S1203).

[0077]

In the second method where output attribute data set in another file from the JPEG data is changed, instead of setting the value in the image type region of the application data segment "0xFFEF" in the JPEG data in the steps S1202 and S1203 in Fig.12, an equivalent value is set as the data type of the JPEG data in data display attributes stored in another file.

[0078]

In the third method where the output attribute data embedded in the JPEG data is deleted, the image type region in the application data segment "0xFFEF" in the JPEG data is deleted and the contents are separately stored in an output attribute data file, or the original JPEG data can be recovered by deleting the output attribute data file.

[0079]

As described above, JPEG images can be displayed with high visibility by setting the output attribute data of the JPEG images in the data broadcasting device 1 and referring to the data at the time of displaying them in the receiving terminal device 2.

Further, the receiving terminal device 2 can change the output attribute data set in the JPEG images to adapt the output attribute data to the receiving terminal device 2, and it can remove information

added in the process of broadcast to store the JPEG data in the original format; it can also redistribute the JPEG data in the original format.

[0080]

As described so far, according to the data broadcast system of the embodiment of the invention, the receiving terminal device 2 receives multimedia data and output attribute data broadcast from the data broadcasting device 1, and stores, manages and displays the data. It also processes the multimedia data to generate the output attribute data from the multimedia data, to embed the output attribute data into the multimedia data, etc.

[0081]

In the case of a system where the receiving terminal device 2 further distributes multimedia data to another receiving terminal device (when the receiving terminal device 2 has a function as a relay station, for example), the data analyzing portion 24 in the receiving terminal device 2 may be provided with the function to generate the output attribute data. In this case, the data broadcasting device 1 is not necessarily required to generate the output attribute data; it can broadcast only the multimedia data.

[0082]

For the method of providing from the transmitting side to the receiving side the display attribute about JPEG data, i.e. the information as to whether or not to apply dithering on the basis of whether it is a natural painting or line drawing, the method can be applied not only to the data broadcasts described in this embodiment

but also to various common data communications. This method is especially effective for receiving terminal devices with lower performance.

[Brief Description of the Drawings]

[Fig.1]

A block diagram showing the structure of a data broadcast system according to an embodiment of the present invention.

[Fig.2]

A diagram showing an example of the relation among multimedia data.

[Fig.3]

A diagram showing an example of a table 130 defining types of multimedia data.

[Fig.4]

A flowchart showing one example of a process in which the data broadcasting device 1 of Fig.1 generates output attribute data from multimedia data.

[Fig.5]

A flowchart showing another example of a process in which the data broadcasting device 1 of Fig.1 generates output attribute data from multimedia data.

[Fig.6]

A diagram showing examples of output attribute data tables for storing the output attribute data.

[Fig.7]



A diagram showing examples of output attribute data embedded in HTML data and screens displaying the data.

[Fig.8]

A diagram showing an example of the output attribute data embedded in JPEG data.

[Fig.9]

A diagram showing the structure of MOT protocol 911.

[Fig.10]

A flowchart showing an example of a process in which the receiving terminal device 2 of Fig.1 displays HTML data using output attribute data.

[Fig.11]

A flowchart showing an example of a process in which the receiving terminal device 2 of Fig.1 displays JPEG data using the output attribute data.

[Fig.12]

A flowchart showing an example of a process in which the receiving terminal device 2 of Fig.1 sets a display attribute of JPEG data.

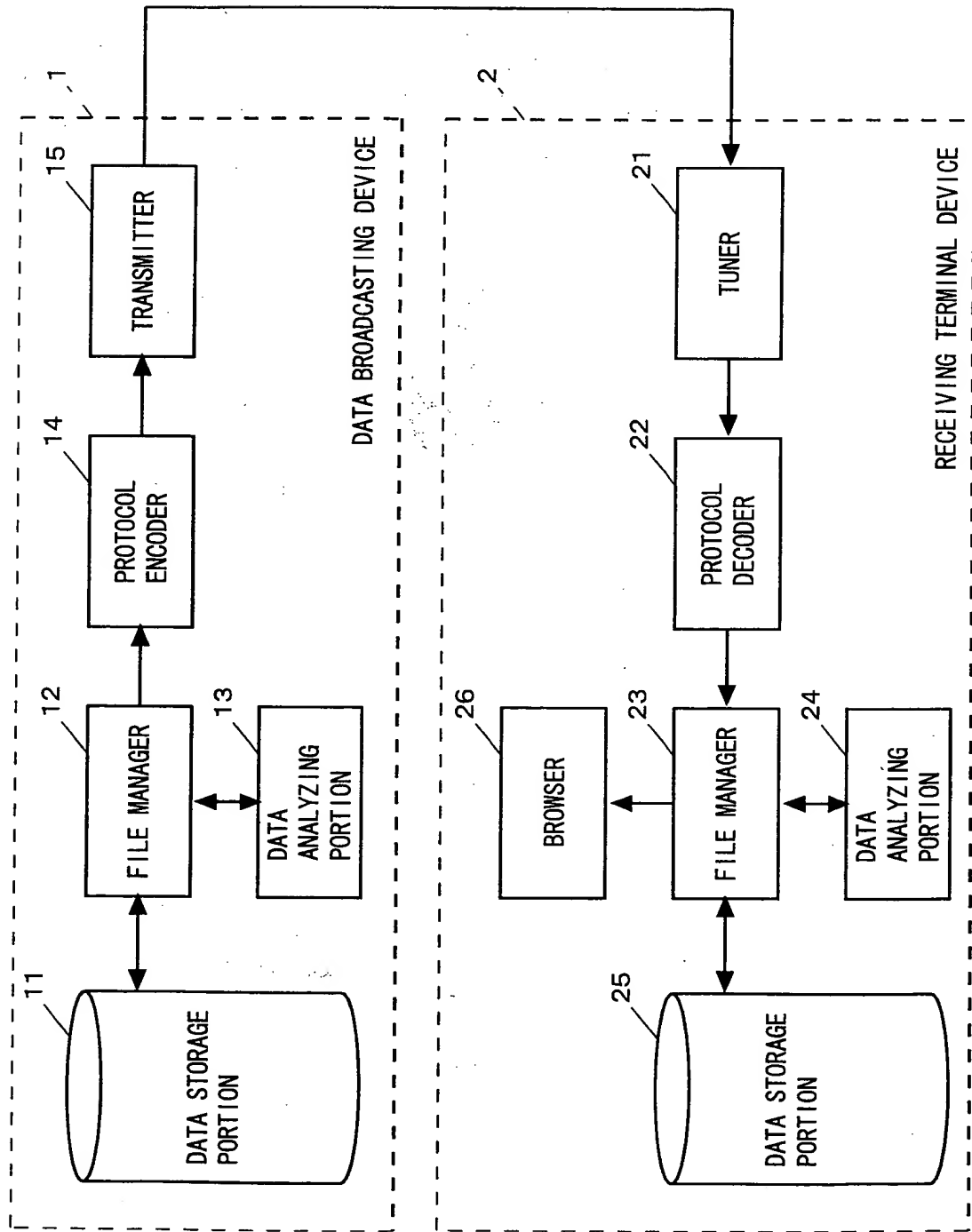
[Description of the Reference Characters]

- 1 ... data broadcasting device
- 2 ... receiving terminal device
- 11, 25 ... data storage portion
- 12, 23 ... file manager
- 13, 24 ... data analyzing portion

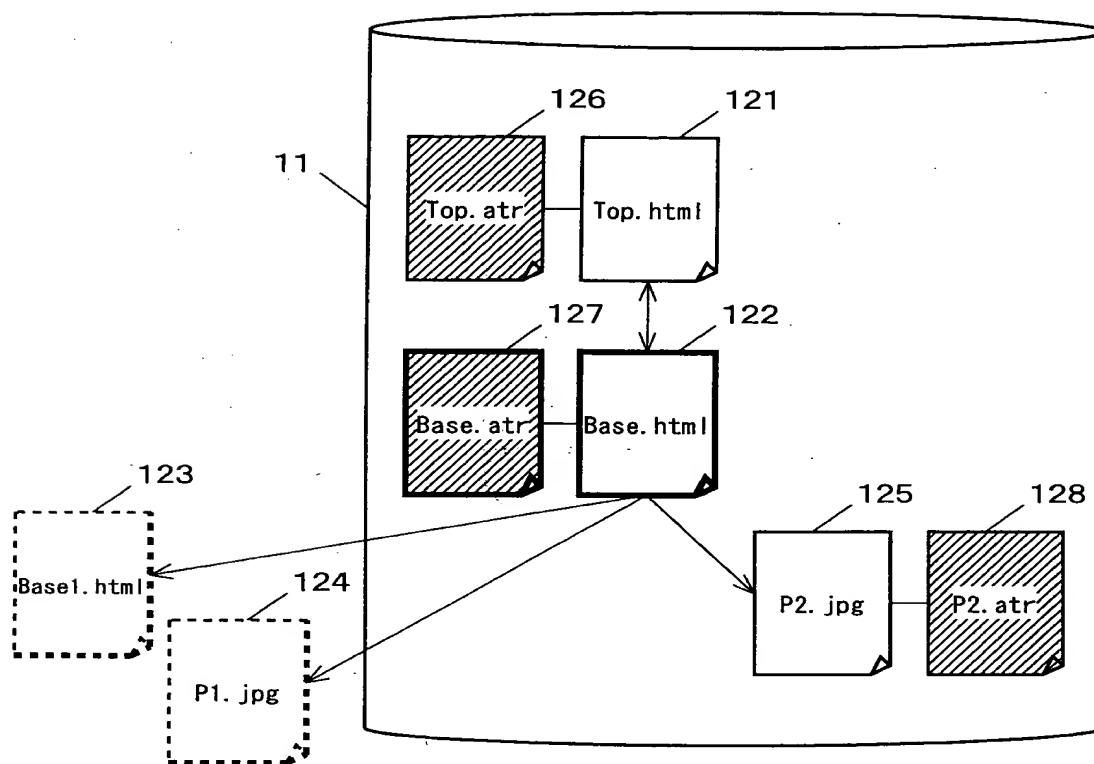
14 ... protocol encoder  
15 ... transmitter  
21 ... tuner  
22 ... protocol decoder  
26 ... browser  
121 to 125, 914 ... multimedia data  
126 to 128, 915 ... output attribute data  
130, 161 to 163 ... table  
701 ... data  
702, 703 ... display screen  
810 to 813 ... region  
911 ... MOT protocol  
912 ... MOT header  
913 ... MOT body

[Document Name] DRAWINGS

【Fig. 1】



【Fig. 2】

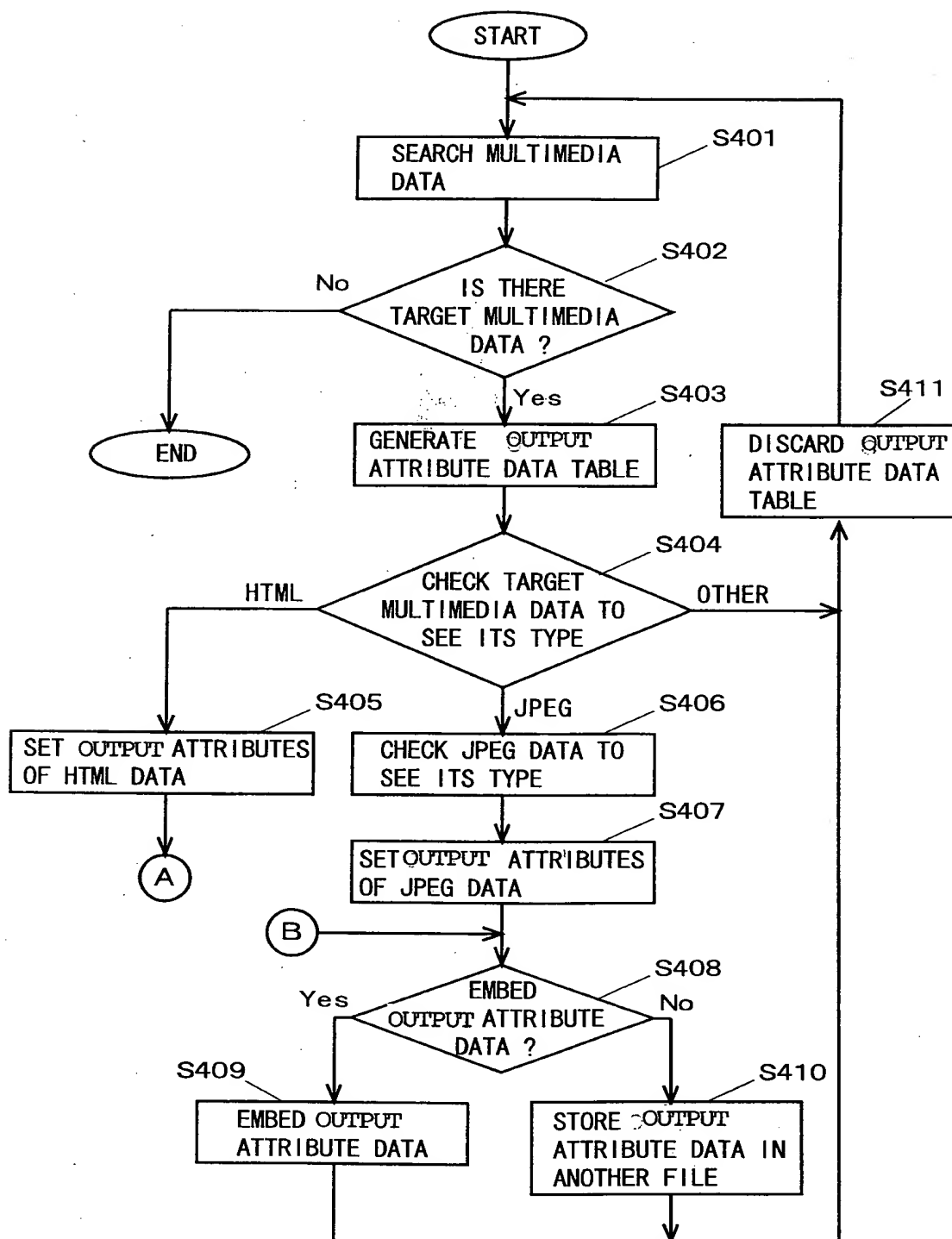


【Fig. 3】

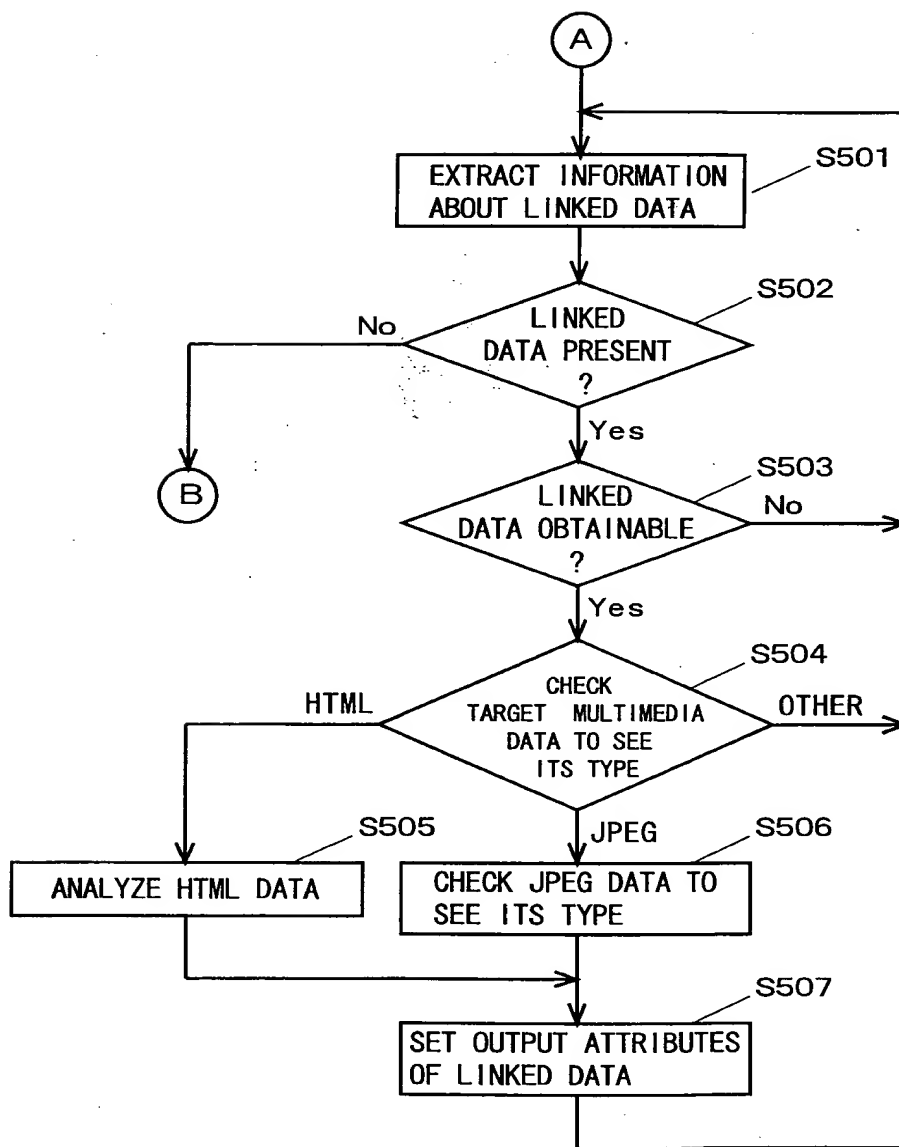
130

DATA TYPE	DATA TYPE ID	SIGN
HTML	0	L
JPEG NATURAL PAINTING	1	P
JPEG LINE DRAWING	2	D

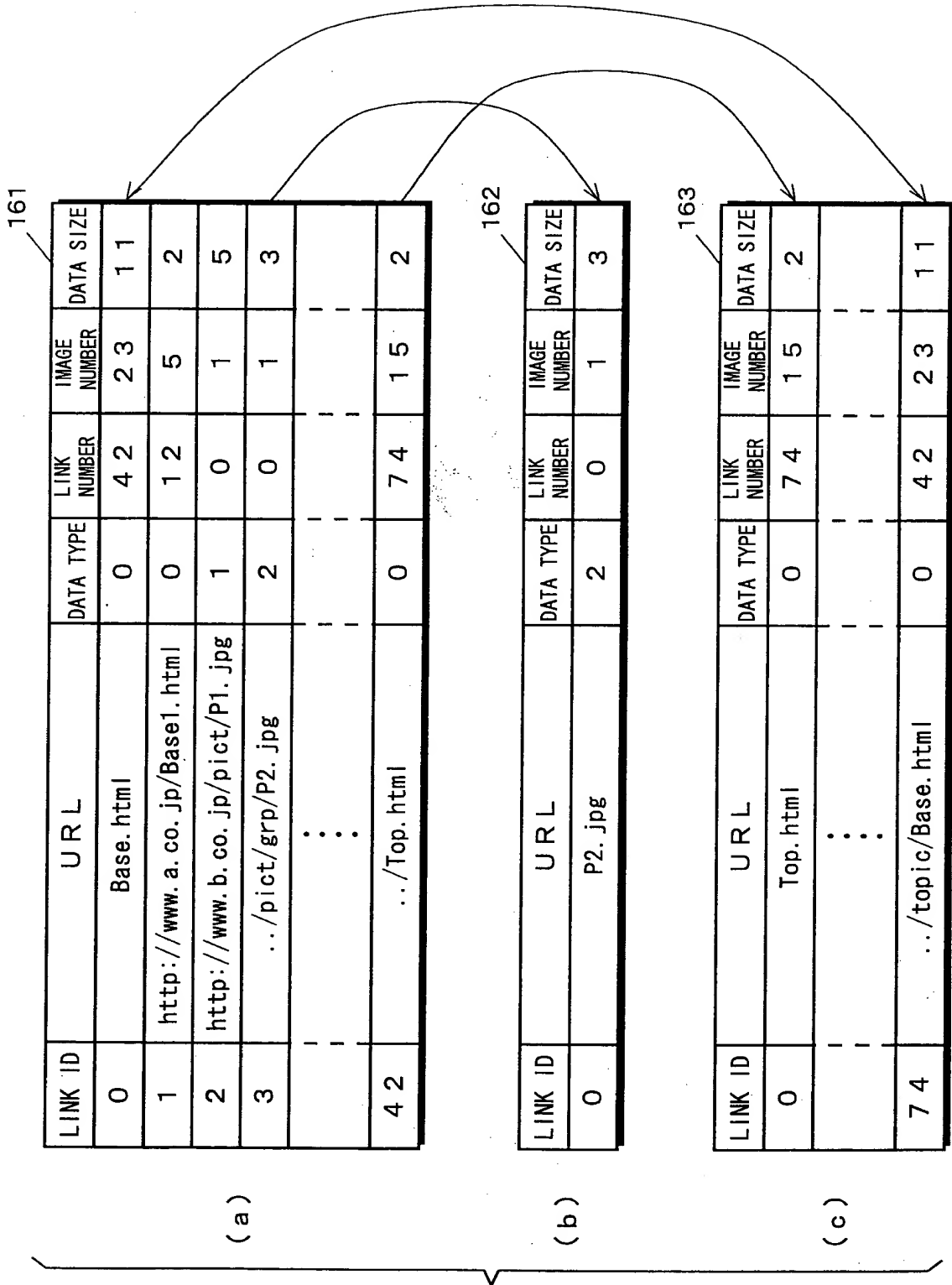
[Fig. 4]



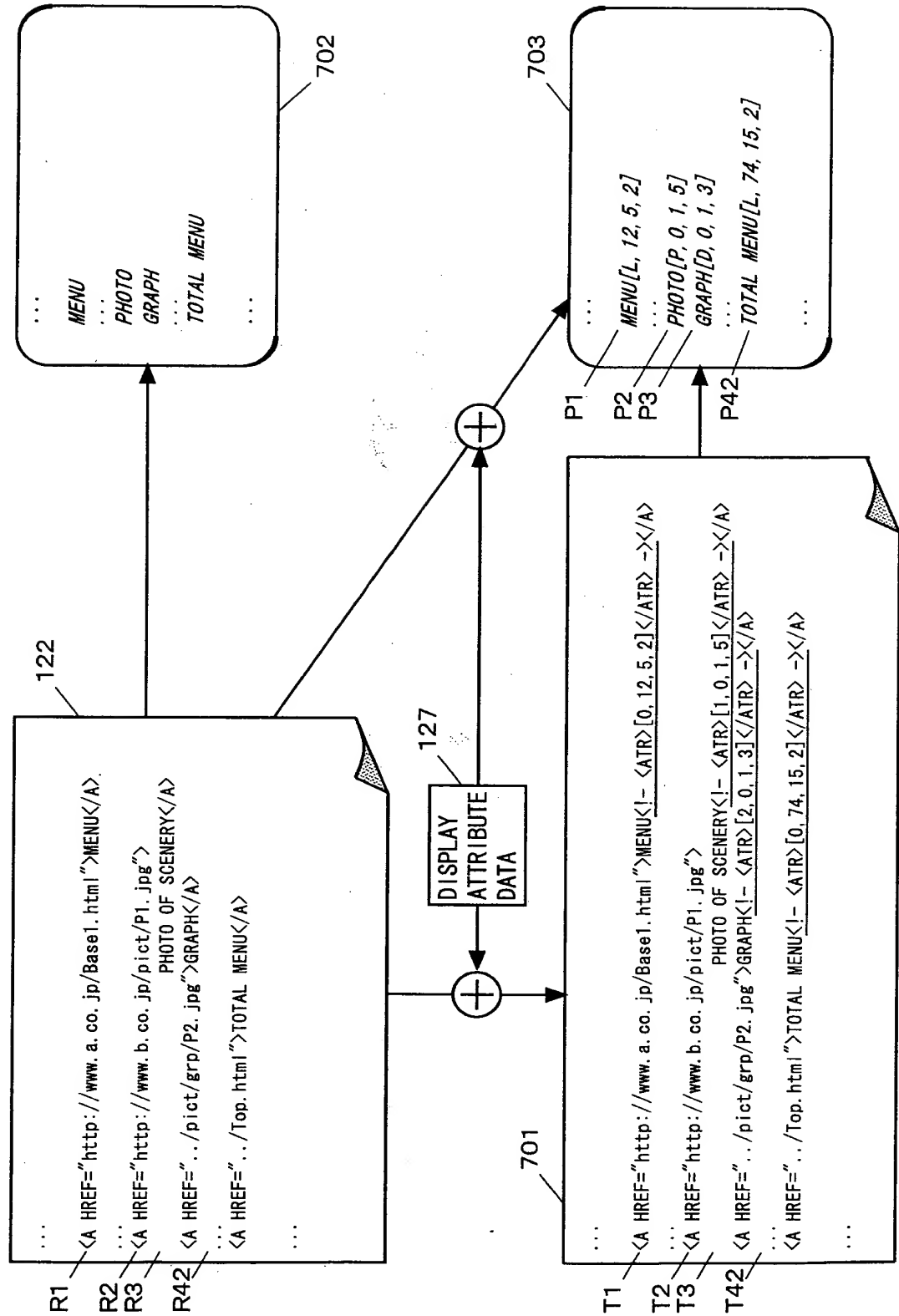
[Fig. 5]



【Fig. 6】

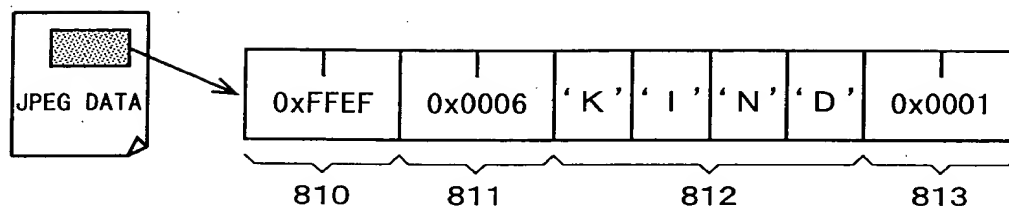


【Fig. 7】

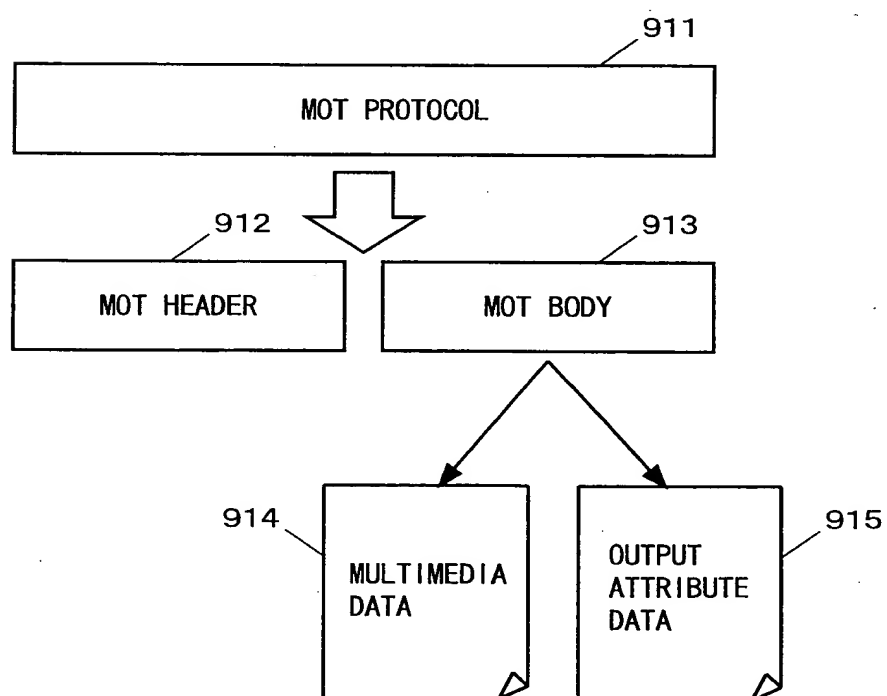




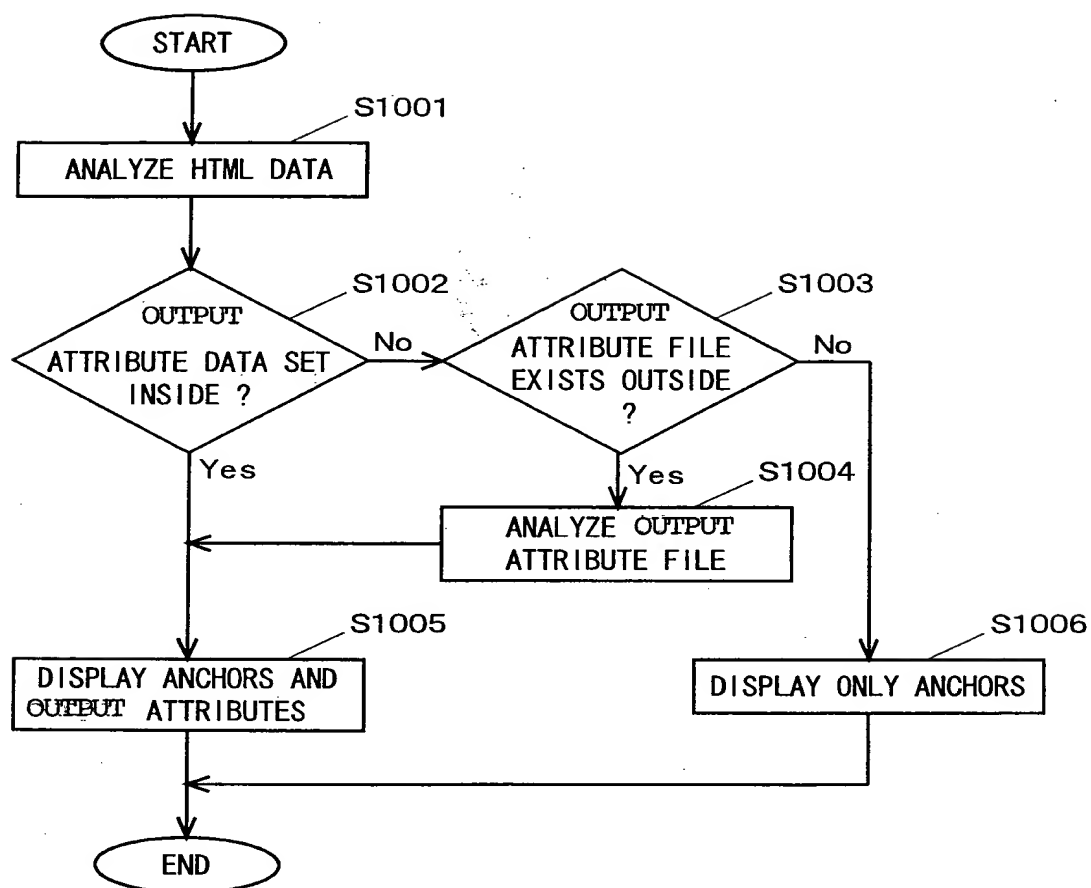
【Fig. 8】



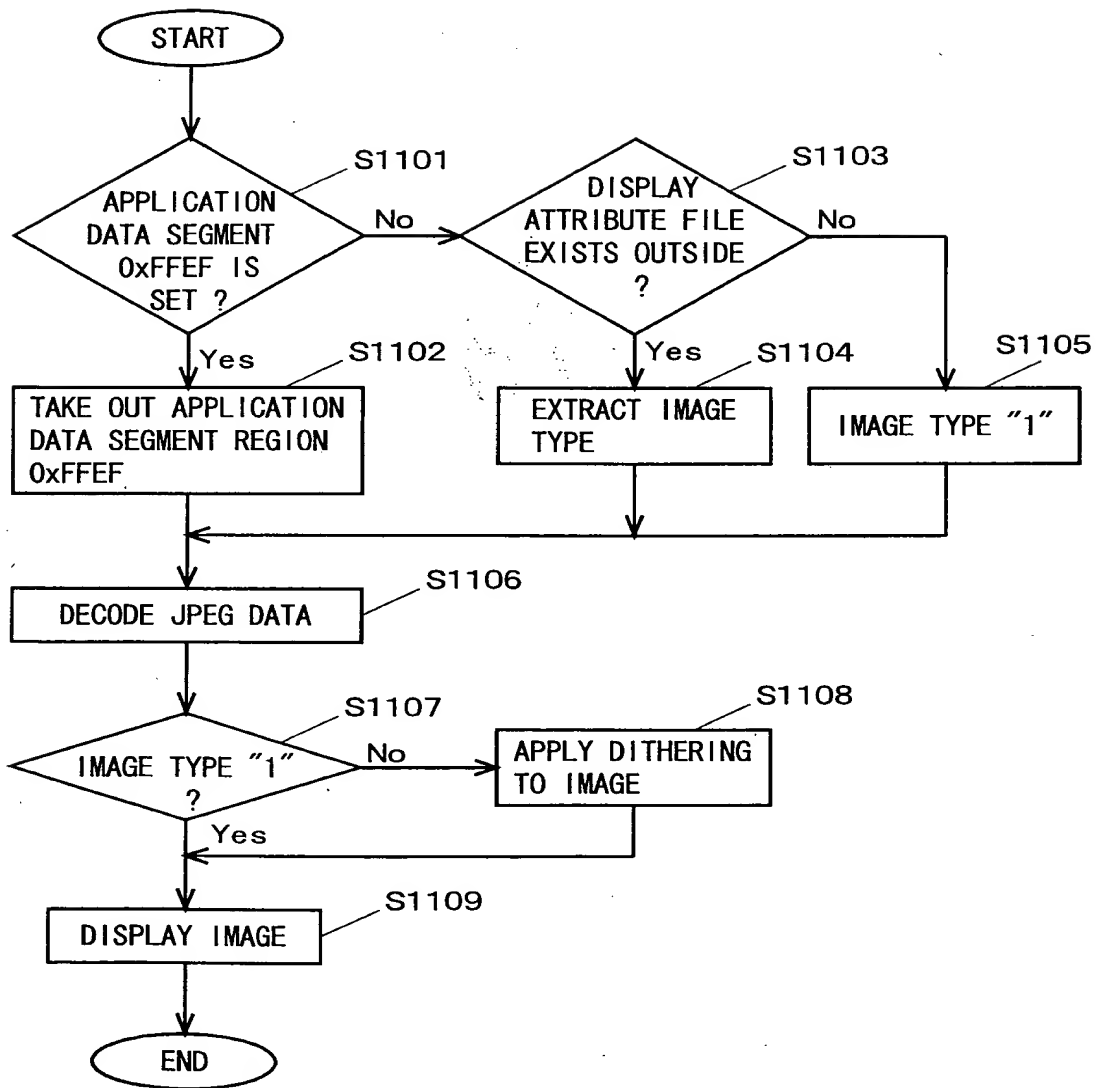
【Fig. 9】



[Fig. 1 0]



[Fig. 11]





[Document Name] ABSTRACT

[Summary]

[Object] To provide a data broadcast system which generates output attribute data about multimedia data (MM data) in advance and broadcasts the output attribute data together with the MM data so that the receiving terminal can grasp the outlines of the entire MM data and improve the visibility.

[Solving Means] A data broadcasting device 1 generates output attribute data about MM data in a data analyzing 13. The output attribute data exists alone or is embedded in the MM data. The MM data and the output attribute data are encoded in a protocol encoder 14 and broadcast from a transmitter 15. A receiving terminal device 2 receives the broadcast data in a tuner 21 and obtains the MM data and output attribute data in a protocol decoder 22. When a browser 26 displays the obtained MM data, the output attribute data is referred to and information related to the MM data is displayed together. A data analyzing portion 24 analyzes the MM data and extracts the output attribute data embedded therein.

[Selected Figure] Fig.1